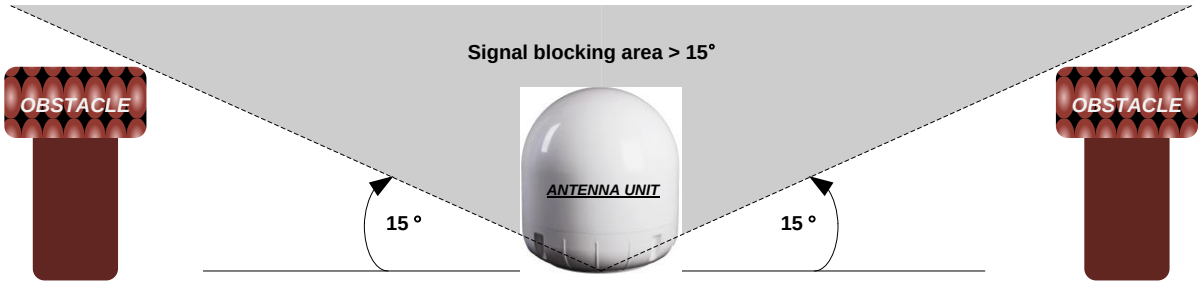
User’s manual

Inland Cargo Ship VSAT

1. Installation

1.1 Antenna Position

There should be no obstacle between antenna and satellite.
Best location should be selected so that the satellite signal is not blocked by some structures.
Furthermore, the antenna should be installed in a stable position in order to maintain stable communications even in cases of sudden turn of the ship, vibration, and shocks.

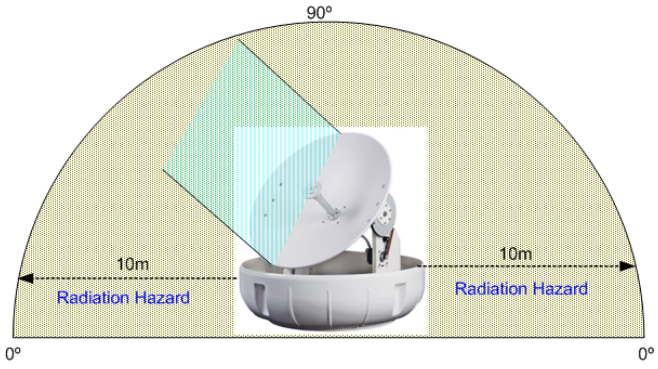


If it should be install on ship in heavy vibration, it must be use anti vibration rubber between antenna and place of location.

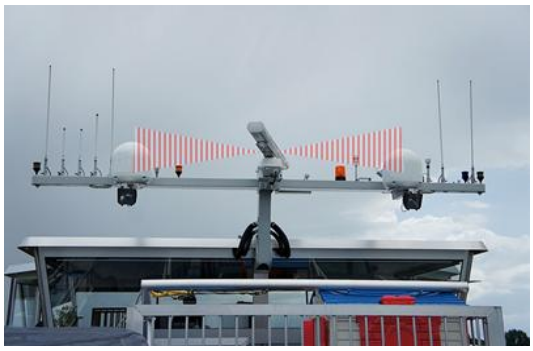
1.2 Antenna Safety (Radiation Hazard)

Prior to working on the antenna system, the power to the transmit/receive equipment must be locked out. When the transmit/receive system is in operation, no one should be allowed anywhere within the radiated beam being emitted from the reflector.

The ultimate responsibility for safety rests with the facility operator and the individuals who work on the system.

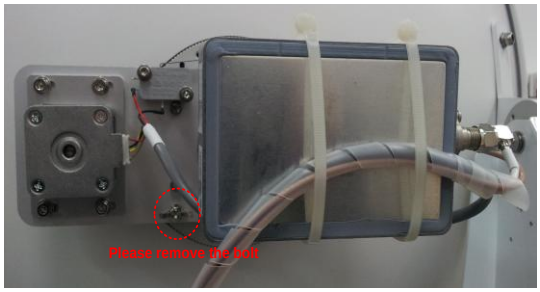


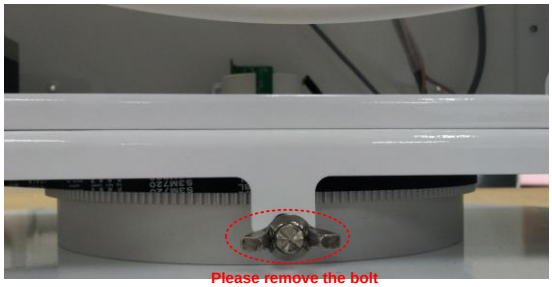
The antenna shall be away from the radiating direction of electric waves of other transmitting antennas (radar, high power transmitters, etc.) that may interrupt the communication with satellite, and it shall keep a physical distance from those antennas.
(Emission of high power signals from radar may damage the antenna.)

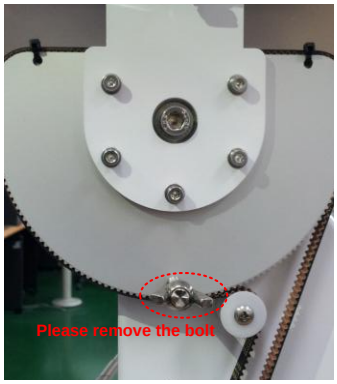


1.3 Package
1.3.1 Unpack Box

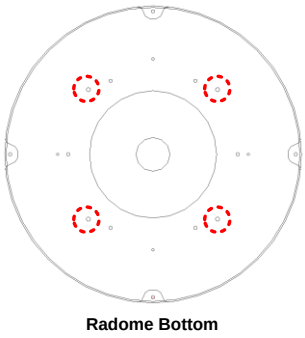
1.3.2 Remove Bolt (Skew Part, Azimuth Part, Elevation Part)

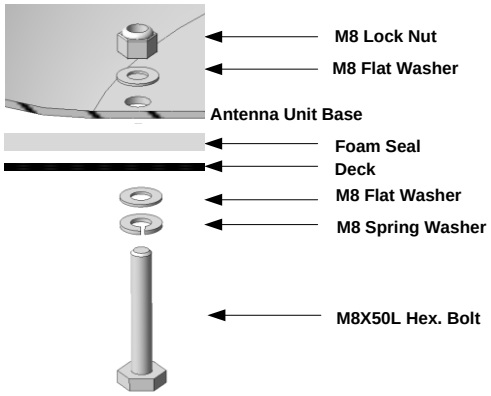






1.3.3 Antenna Mounting





1.3.4 Components

No	Components	Size	Q'ty
1	5C-HFBT RF Cable (RF1)	20m	1EA
2	5C-HFBT RF Cable (TX)	20m	1EA
3	5C-HFBT RF Cable (ACU-IPmodem)	1m	1EA
4	DC Power Cable	2m	1EA
5	Hex Bolt	M8 x 50L	4EA
	Lock Nut	M8	4EA
	Flat Washer	M8	8EA
	Spring Washer	M8	4EA
6	Foam Seal	-	1EA
7	User Manual	-	1EA

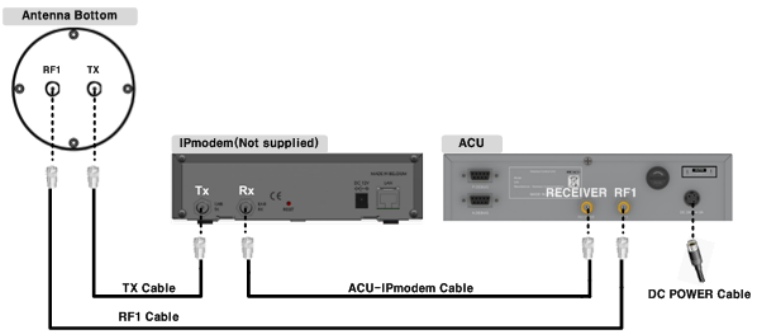
1.3.5 Cable Connection

Coaxial cable connector bracket is indicated under lower radome, and the function is as follows:

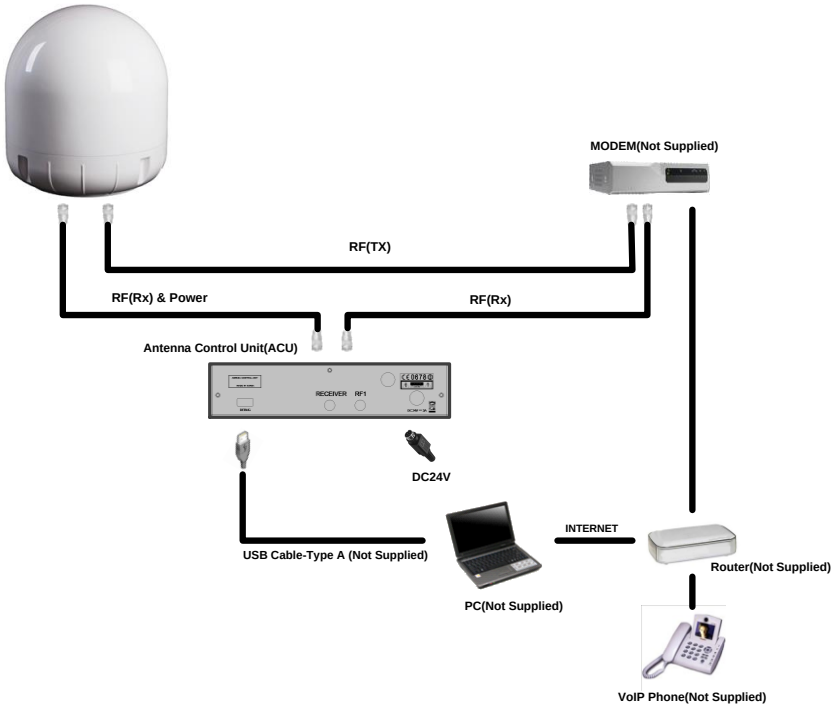
- TX : Connect the TX Cable to the IP modem Tx connector
- RF1 : Connect the Rx Cable to the ACU RF1 connector
- ACU-IP modem: Connect the cable to the ACU RECEIVER and IPmodem Rx connector
- DC POWER: Connect the power cable to the ACD DC connector power of DC 24V

RF1, Tx coaxial cables have impedance of 75ohm and their cable types are 5C-HFBT.

RF1, Tx cables use low-loss cables, and the loss between the antenna and transmitter shall be less than 20dB.



1.3.6 System Cabling



2. Operation

2.1 Description of Operation

When the power is supplied to the antenna for the first time, the antenna executes self-test and initializing process of adjustment. When the initializing process is completed, Antenna searches satellites. The antenna automatically calculates elevation angle and skew angle of selected satellite using built-in GPS in order to determine the initial location of satellite search. It identifies satellite after the search, and antenna position is re-adjusted if necessary. After satellite identification, skew angle is automatically adjusted.

2.1.1 Antenna Searching

This function allows the antenna to search satellites by orienting toward target satellite after self-test and initializing process of adjustment when the power is supplied to the antenna for the first time, sensing the power of satellite signal, and measuring signals in preset frequency.

2.1.2Auto Tracking

A certain value of sensitivity signal level is set in order to sense satellite signals, and the antenna tracks satellites when signal level that is higher than the presetting value is measured.

2.1.3 Satellite Identification

This function identifies the present satellite by randomly searching satellites. After satellite search, the antenna confirms if unique ID assigned to each satellite coincides with that of target satellite. If the confirmed satellite and the selected satellite are different, the antenna calculates the precise position and automatically re-searches satellites.

2.1.4 Antenna Signal Blocking

When the antenna cannot receive the satellite signal due to surrounding conditions (ex. moving under a bridge or signal block due to trees and buildings), transmission of communication modem automatically stops and takes about 2 minutes till reboot the satellite signal again due to booting time of modem. When the antenna lost the satellite signal, it takes about 1 minute to receive the signal again.

2.2 ACU Installation

ACU may be installed vertically/horizontally.

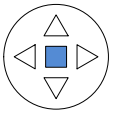
a. ACU shall be installed on where users can use it conveniently.

b. ACU shall be installed on where there is no influence of magnetic interference.

FRONT

REAR

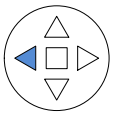
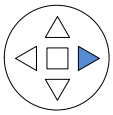
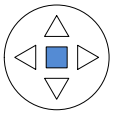
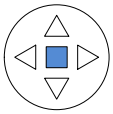
2.2.1 ACU Operation Flow Chart

[MFACE] V-SAT ANTENNA SYSTEM		① Welcome message
Please Wait! System check...		② Communication is being checked between the antenna and the ACU.
SAT 1:<NAME> <FREQ.> ◀SAT 1 ■ ▶MENU ▲		③ The antenna is searching for SAT 1. ■: Press this Immediately go to next menu or Proceed automatically after 5 seconds
Data Sending…		④ Sending data
Please Wait! GPS DATA		⑤ Waiting GPS Connection
Latitude: ### Longitude: ###		⑥ GPS data display
SAT 1:<NAME> <FREQ.> INITIAL MODE ▼		⑦ Move the antenna to start position
SAT 1:<NAME> <FREQ.> S-Searching ▼		⑧ The antenna is searching for Satellite 1.
SAT 1:<NAME> <FREQ.> S-Online ▼		⑨ The antenna has locked the satellite and is now tracking

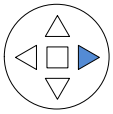
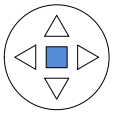
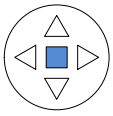
2.2.2 How to change Transponder (Frequency)

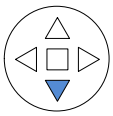
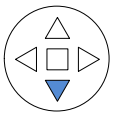
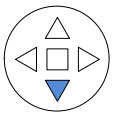
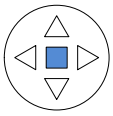
The target transponder can be change according to following steps.

Programmed transponder is 12070 / 12685 / 12725 / 12645

SAT 1:<NAME> <FREQ.> ◀SAT ? ■ ▶MENU ▲		① Press ◀ key for tracking other satellite
SAT 1:<NAME> <FREQ.> ◀- ▶+ ■SET ▲		② Press ◀or ▶key for change the target satellite
SAT 2:<NAME> <FREQ.> ◀- ▶+ ■SET ▲		③ Select the target satellite
SAT 2:<NAME> <FREQ.> CHANGE? ■YES ▲NO		④ The antenna is tracking satellite 2.

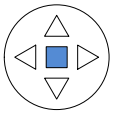
2.2.3 Edit Target Satellite

SAT 1:<NAME> <FREQ.> ◀SAT ? ■ ▶MENU ▲		① Press ▶ key to enter MENU mode
EDIT SAT INFO? ◀ESC ■YES ▶NEXT		② Press ■ key to enter EIDT SAT INFO? mode
SAT 1:<NAME> <FREQ.> ◀- ▶+ ■SET ▲		③ Set the satellite name ◀: Shows previous satellite name ▶: Shows next satellite name ■: Select the displayed satellite for editing and move to next window

Orbit: 23.5E ◀- ▶+ ■SET ▼N ▲U		④ Edit the satellite orbit ▶: increases the value ◀: decreases the value Change the underscored digit using the ▶/◀ key ■: accept the value and move to next digit. ▼: move to next window ▲: move to previous window
F/S:12525 27500 ◀- ▶+ ■SET ▼N ▲U		⑤ Edit the tracking frequency(MHz) and symbol rate(KHz) – see section ④
NID: 00003 ◀- ▶+ ■SET ▼N ▲U		⑥ Edit the satellite network ID(NID) – see section ④
POL: HL/HB ◀- ▶+ ■SET ▼N ▲U		⑦ Edit the TP polarization (HL/HB -> VR/LB ->HL/HB->VR/HB) – see section ④
SAVE? ■YES ▲NO		⑧ ■: save the edited information ▲: cancel and return to MENU mode

2.2.4 Display Version

This sequence enables you to see what version of antenna and ACU software version are programmed into your system.

SAT 1:<NAME> <FREQ.> ◀SAT ? ■ ▶MENU ▲		① Press ▶ key to enter MENU mode
VERSION CHECK? ◀PRE ■YES ▶NEXT		② Press ■ YES to view version
SSV-20601 ▼N ▲U		③ Antenna product name is shown. ▼: view PCU F/W version ▲: return to previous mode
PCU F/W VER: 2.0 ▼N ▲U		④ PCU firmware version is shown. ▼: view ACU F/W version ▲: return to previous mode
ACU F/W VER: 2.0 ▼N ▲U		⑤ ACU firmware version is shown. ▼: view IMU F/W version ▲: return to previous mode
IMU F/W VER: 2.0 ▼N ▲U		⑥ IMU firmware version is shown. ▼: view ACU F/W version ▲: return to previous mode

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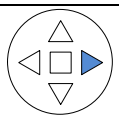
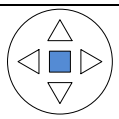
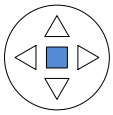
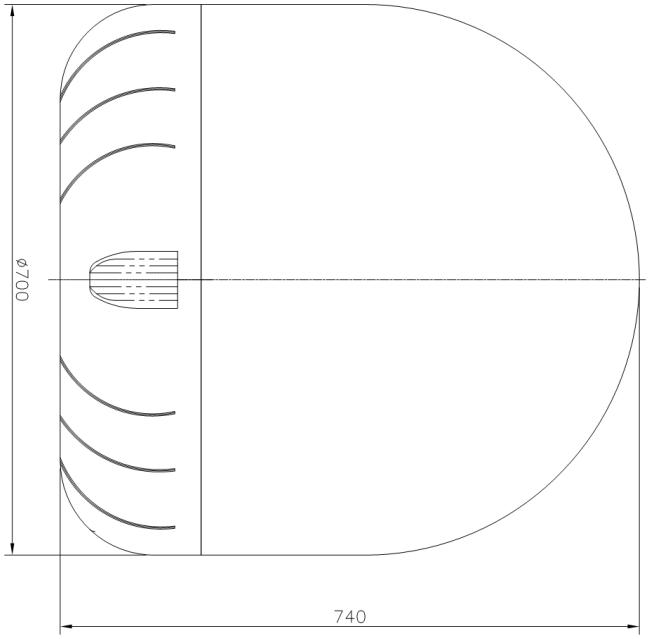
2.2.5 Setting the factory default parameters

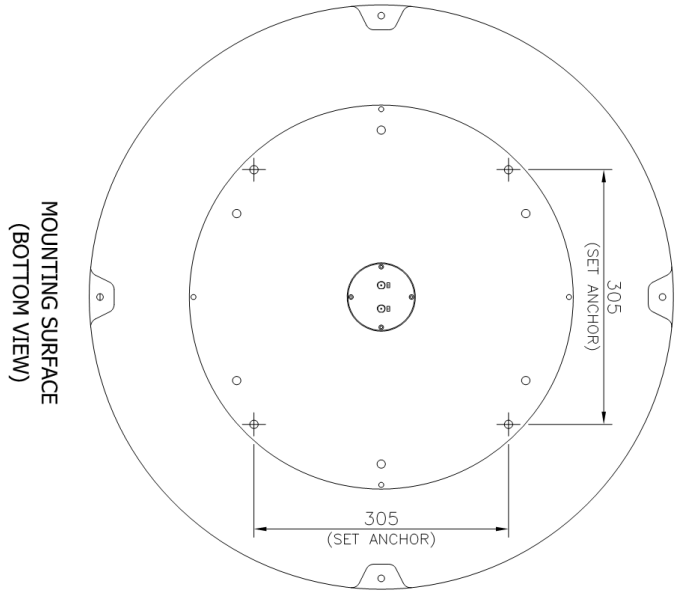
SAT 1:<NAME> <FREQ.> ◀- ▶+ ■SET ▲		① Press ▶ key to enter MENU mode
FACTORY INIT? ◀PRE ■YES ▶NEXT		② Press ■ YES to enter the factory initialize mode
INIT START? ■YES ▶NO		③ Press ■ YES to set initial parameters. ▲: return to previous mode
Please Wait! Initializing...		Wait for parameter to initialize.
INIT Done! Please Reboot!		You have successfully completed t he Initialize and system restart.

Appendix A : Specification

2-Axis Inland cargo ship VSAT			
RF Specification(Antenna)			
RX Frequency	10.95 ~ 12.75GHz	**TX Frequency**	13.75 ~ 14.5GHz
Rx Gain	35.5dBi@Mid band	**Tx Gain**	37dBi@Mid band
Cross pol	28dB@boresight	**LNB Control**	AUTO
LNB	iLNB (Lo:9.75GHz, 10.6GHz)	**BUC**	0.5W
G/T	14.0dB/K	**Operating Platform**	2 Axis
Mechanical Specification			
Dish Diameter	60cm / 23.6"	**Radome Dimension**	700mm(D)×740mm(H)
Antenna Weight	24kg	**Radome Material**	Plastic
Stabilized Platform	2-Axis	**Roll & Pitch Response Rate**	10°/sec
Azimuth Range	680°	**Turn Rate**	10°/sec
Skew Control	Auto (-120° ~ 120°)	**Elevation Range**	0°~90°
Humidity	100% @40℃	**Operation Temp**	-20℃~55℃
GPS, Gyro	built-in	**Storage Temp**	-30℃~70℃
Antenna Control Unit (ACU)			
ACU Size	220×155×50mm	**Display**	LCD
HMI	Push Key	**Input Power**	18~28VDC
External I/O	USB (Type A)	**Output Power**	24VDC, 3A(Max), 75W
		Modem Interface	F-con
Packing			
Size	780×760×880mm	**Gross Weight**	30kg
Material	Paper carton		

Appendix B : Dome Drawing





Appendix C : Quick ACU guide